

Claims

1. A method to isolate and characterize a membrane-bound receptor along with its microenvironment which method comprises

providing a solid support coupled to a ligand which specifically binds said  
5 receptor;

treating said solid support with a sample comprising nucleated cells or organelles thereof comprising said membrane-bound receptors, and which cells or organelles have not been surface-treated,

wherein a complex is formed between said membrane-bound receptor and the  
10 ligand thus generating a ligand/receptor complex comprising the receptor and its microenvironment, which complex is coupled to solid support through the ligand;

separating the solid support from the remainder of the sample;

subjecting the separated solid support to a force sufficient to dissociate the  
15 receptor and its microenvironment from the membrane but insufficient to disrupt the ligand/receptor complex;

thus obtaining solid support coupled to a ligand/receptor complex whereby the receptor retains its microenvironment but is separated from the membrane, and

analyzing the microenvironment of the receptor.

2. The method of claim 1 which further comprises removing the  
20 ligand/receptor complex comprising the receptor and its microenvironment from the solid support.

3. The method of claim 1 which further comprises removing the receptor and its microenvironment without ligand from the solid support.

4. The method of claim 1 wherein the cells are vertebrate cells.

25 5. The method of claim 4 wherein the cells are tumor cells or diseased cells..

6. The method of claim 3 wherein the cells are hematopoietic cells, or cells from adipose, areolar, connective, elastic, epithelial, endothelial, neural, mucous or reticular tissues.

5 7. The method of claim 1 wherein the ligand is an antibody or an immunospecific portion thereof.

8. The method of claim 1 wherein the receptor comprises an HLA antigen.

9. The method of claim 1 wherein the receptor comprises a tumor associated antigen.

10 10. The method of claim 1 wherein the receptor is a cytokine receptor, a hormone receptor, an opioid receptor, or a steroid receptor.

11. The method of claim 1 wherein the force is achieved through extrusion.

12. The method of claim 1 wherein the force is achieved through vortexing or shaking.

13. The method of claim 1 wherein the force is achieved through sonication.

15 14. The method of claim 1 wherein the solid support comprises beads.

15. The method of claim 14 wherein said beads are polyacrylamide beads, polystyrene beads, Sephadex beads, or latex beads.

16. The method of claim 1 wherein the solid support is a multi-well plate.

20 17. The method of claim 2 wherein the ligand is coupled to the solid support through a linker containing a photocleavable portion and said removing is effected by exposing the linker to light.

18. The method of claim 2 wherein the ligand is coupled to solid support through a linker containing a portion cleavable by an enzyme and said removing is effected by exposing said linker to said enzyme.

5 19. The method of claim 3 wherein said removing is achieved by treating the complexed solid support with a substance that binds said ligand in competition with the receptor.

20. A method to recover a multiplicity of receptors along with their microenvironments which method comprises:

10 providing a multiplicity of solid support portions each coupled to a different ligand;

5 6 treating a sample comprising nucleated cells that comprise at least two cell surface receptors, wherein said cells are not surface treated with said multiplicity of solid support portions under conditions wherein ligand/receptor complexes are formed between said ligands and receptors at said cell surfaces;

15 removing the solid support portions from the sample; and

subjecting the solid support portions to forces sufficient to remove the receptors and their microenvironments from the surface of said cells but insufficient to disrupt the ligand/receptor complexes, and

analyzing the respective microenvironments of at least two receptors.

20 21. The method of claim 20 which further comprises removing the ligand/receptor complexes or the receptors and their microenvironments from the solid support.

22. The method of claim 20 which further includes identifying the receptors.

23. The method of claim 21 which further includes identifying the receptors.

25 24. The method of claim 22 which further includes organizing the identified receptors into a profile characteristic of the membrane sample.

25. The method of claim 23 which further includes organizing the identified receptors into a profile characteristic of the membrane sample.

26. The method of claim 20 wherein each of said multiplicity of portion is coupled to a different ligand.

5 27. The method of claim 26 wherein said ligands are monoclonal antibodies.

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